GETTING HITCHED: WHAT TO KNOW BEFORE YOU TOW p. 12

KNOWLEDGE

VOL 2 APRIL 2008

OFFICIAL SAFETY MAGAZINE OF THE U.S. ARMY

RULES TO LIVE BY p. 5

U.S. ARMY CIVILIAN PERSONNEL DEVELOPMENT

https://crc.army.mil

KNOWLEDGE

OFFICIAL SAFETY MAGAZINE OF THE U.S. ARMY

contents

SAFETY TI THE AGES

Are you between the age of 18 and 30? Is this article pertinent to you?

Do you ever feel Army leadership pens articles that are about you, rather than for you? Talk at you rather than to you? While you might think this is true, rest assured, the U.S. Army Combat Readiness/Safety Center writes articles especially for you.

The reason for this?

You (18 to 30-year-olds) are esteemed Teammates. You have a critical part in our Army's successes, both on and off the battlefield. We, as an Army team, haven't and won't be successful in our missions without you. Your presence and contributions are invaluable and the cornerstone of our successes.

What else do we know?

We know that you are all Soldiers with opportunities to be outstanding and influential Leaders. It does not require a high rank to make a Leader, but rather a Leader is a Soldier or Army member with an

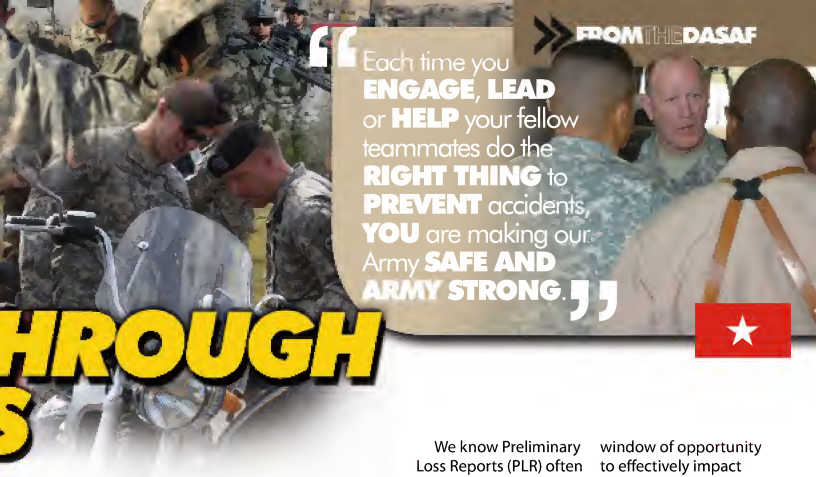
U.S. ARMY COMBAT READINESS/SAFETY CENTER

https://crc.army.mil

Mission statement: USACRC supports our Army at war by collecting, storing, analyzing, and disseminating actionable information to assist Leaders, Soldiers, Families, and Civilians in preserving/protecting our Army's combat resources.

We welcome your feedback. Please e-mail comments to **knowledge@crc.army.mil**.

Knowledge is published monthly by the U.S. Army Combat Readiness Center, Bldg 4905, 5th Ave., Fort Rucker, AL 36362-5363. Address questions regarding content to the editor at (334)255-2688. To submit an article for publication, e-mail knowledge@crc.army.mil or fax (334)255-9044. We reserve the right to edit all manuscripts. Address questions concerning distribution to (334)255-2062. Visit our Web site at https://crc.army.mil. Information in *Knowledge* is not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense, or the U.S. Army. Contents are specifically for accident prevention purposes only. Photos and artwork are representative and do not necessarily show the people or equipment discussed. Reference to commercial products does not imply Army endorsement. Unless otherwise stated, material in this magazine may be reprinted without permission; please credit the magazine and author.



HROUGH S

understanding and willingness to engage and do the right thing. This type of leadership can, does and continues to save lives.

Safety transformation is the shift in mind set from an older, reactive safety culture to a new, predictive mind-set that incorporates risk management practices and actions into daily activities. While our Army continues through a safety transformation, your actions, leadership and continued commitment are invaluable. You and your peers are integral to this transformation. Each time you engage, lead or help your fellow teammates do the right thing to prevent accidents, you are making our Army safe and Army strong.

We know our Warriors live and operate on the leading edge, however they should not be alone on that edge. Leaders must be there with them, stay engaged and take accountability. There is no such thing as an anonymous Leader. Leaders commit.

We know when accountable Leaders like you engage, the results immediately save lives and promote change in our Soldier's culture, instinct and insight into the Army's future.

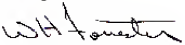
We know Preliminary Loss Reports (PLR) often reveal preventable mishaps where engaged Leaders could have made a difference. Someone always knows – someone knows when a platoon member just bought a motorcycle but never completed required training . . . someone knows when an aviator's reputation is to "cowboy" aircraft . . . someone knows when Soldiers routinely fail to buckle up when driving. That "someone" who knows must step up and engage; it will save lives.

We know we "Never Leave a Fallen Comrade." By engaging at the lowest level, you can prevent the fall of a fellow Soldier. The tools are there and the window of opportunity to effectively impact Soldiers is now. Successful safety preventive measures and actions are seamlessly woven into the fabric of our Army's culture.

So…my younger friends and fellow Soldiers. This is for you, about you, and enlists you as a fully-involved partner in making our Army a safer place to live, work and fight.

Your dedication to duty is unmatched - always remember, what you do right now changes everything.«

Army Safe is Army Strong!!



William H. Forrester
Brigadier General, USA
Commanding

RULES TO LIVE BY

There is a disturbing new trend in our military—some units are experiencing the loss of more Soldiers at home station than deployed to combat!

Multi-National Force-Iraq Command Sgt. Maj. Marvin Hill once told me a Soldier knows what is important to a unit within an hour of arriving. If a unit has standards and discipline, it is very apparent. However, if Soldiers sign in and the unit leaves them to their own devices, they'll take it that nobody cares enough to ensure they don't get into trouble. Once they have gotten that message, it can be hard to make them believe anyone takes their off-duty actions seriously. We know when an attitude like that sets in, it can be hard to overcome because Soldiers don't afford Leaders opportunities at second and third chances.

So how do we make this work for the safety of Soldiers? When it comes to our married Soldiers redeploying home, the U.S. Army Combat Readiness/Safety Center (USACRC) has worked with Morale, Welfare and Recreation (MWR) to create the Family Engagement Kit. The kit provides spouses with useful tools and resources to help them care for their Soldiers as they return. And for single Soldiers, there is the Better Opportunities for Single Soldiers (BOSS) Engagement Kit.

During a recent redeployment video teleconference (VTC), Maj. Gen. Rick Lynch, commander of the 3rd Infantry Division, stated, "All accidents are preventable and predictable." I couldn't agree more with him and his philosophy. As I speak with Soldiers, Families and Civilians, it becomes very apparent we are headed in the right direction in fighting and winning the Global War on Terrorism. Nearly seven years into this fight, we are seeing the fruits of our labor and appear to have turned the corner. Winning the war on accidents at home station is another story. Two-thirds of all accidents happen at home station during off-duty hours. Why is it that it's safer, statistically speaking, to drive on duty and in combat than on the streets back at home station? Most would say that engaged leadership directly influences our on-duty accident numbers. If that is true, then why doesn't engaged leadership work off-duty as well? So I ask each of you, how can we transition the great work we do during deployments back to home station?

Recipe for Safe Home Station Operation

- Using "tough love"—imposing strict standards and discipline will save lives. Because of that, we need to plan for redeployment by assessing the risks much the same as we do for combat. Assess the risks, which include anything that will take a Soldier from our ranks. Conduct a VTC with your headquarters, BTC's home station and safety center 90 days out.
- Have your rear detachment advise you about the risks at home station seen following previous redeployments.
- Prepare to receive and account for Soldiers. Most Soldiers are lost 30 days prior to redeployment till 30 days after.
- Be proactive and energize your garrison's MWR as early as possible to provide Soldiers and Families with events to do on the installation after block leave. It's your city; keep your constituents at home, where you can influence their behavior while having fun.
- Provide predictability. Predictable training and time off during reset doesn't waste Soldiers time and provide Families with knowledge of when they can expect them home.
- Monitor "Leader-to-led" and address leadership gaps.
- Emplace mentorship/certification programs to train and address deficiencies throughout your ranks
- Train safety as part of every mission and seek feedback from your organization during the after-action review (AAR) process.
- Conduct tough, realistic individual training as early as possible and incorporate driving training to solidify teams.

Move left of the boom so redeploying Soldiers don't become statistics. Use your influence as Leaders to train Soldiers to be safe on duty so they'll choose to be safe when they're off duty. Remember, what they do on the installation, you can influence—what they do off the installation you have to react to.

Tod L. Glidewell
Command Sergeant Major
U.S. Army Combat Readiness/Safety Center

BREAKING THE CYCLE

COL. STEPHEN C. SMITH
Directorate of Evaluation and Standardization
U.S. Army Aviation Warfighting Center
Fort Rucker, Ala.

As director of the Directorate of Evaluation and Standardization (DES) at Fort Rucker, I get to view our branch from a perspective that many leaders never have the opportunity to see.

As a battalion commander in the 101st Airborne Division, I was able to employ an attack battalion in combat and see our branch from a division, brigade and battalion perspective. As a staff officer on the Headquarters, Department of Army (HQDA) staff, I was able to see how the Army runs and how our branch fits into the scheme of maneuver from the corporate headquarters perspective. I'm now an old colonel, yet I get to peer into the cockpits of our individual aviators and aircrews, whether they are in a unit deployed downrange or a student on the flight line at Fort Rucker. All of these perspectives give me the unique opportunity to develop my own thoughts on the state of our branch and some things we need to do to ensure the long-term health of Army Aviation throughout what is sure to be a protracted war.

The Realities of the GWOT

What I've seen is no surprise to many of you out there. I call it the "Realities of the Global War on Terrorism (GWOT)." As it dawned on us that we were in

this fight for the long haul, the Army leadership determined we needed to develop a plan to ensure the readiness of our fleet. This led to the creation of the National RESET program. As we started losing aircraft in combat, we realized we needed to improve their survivability. This led to the requirement to PRESET our aircraft prior to deployment to ensure they had the latest modifications. Both of these programs were, and are still, necessary for the health and survivability of our aircraft, but they have taken a toll on our ability to train our crews and get them ready for the rigors of combat. These challenges, along with short dwell times for our Soldiers, have forced commanders to conduct hasty readiness level progressions on their aviators to make as many crews available as they can because of the tremendous demand on aviation in both Operations Iraqi Freedom and Enduring Freedom. Commanders are also driven to hold onto their pilots in command (PCs) and not allow them to attend instructor pilot (IP), tactical operations (TACOPS), safety and maintenance test pilot (MTP) courses because they don't want to lose their immediate skill sets as they prepare for the next deployment.

What our units are experiencing downrange is an insatiable appetite for our capabilities. Every unit seems to be outflying the unit it has replaced. It's not abnormal for our aviators to fly 70 to 100 hours per month while deployed. Our young aviators are logging tremendous amounts of flight time in combat, but in a very narrow mission set. Additionally, we see young aviators flying almost all of their time with other young aviators. This means they are learning from each other most of the time. How do we know they are learning the right lessons?

"What our units are experiencing **DOWNRANGE** is an **INSATIABLE APPETITE** for our capabilities. **EVERY UNIT** seems to be **OUTFLYING** the **UNIT** it has **REPLACED**."

The Trends

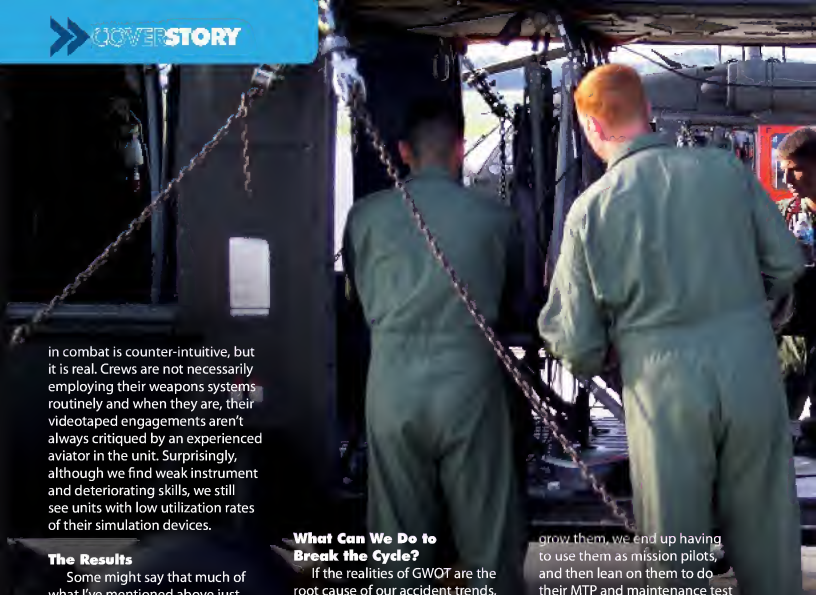
The commanding general (CG) of the U.S. Army Aviation Warfighting Center is the proponent for the U.S. Army Aviation Standardization Program. The DES is the CG's arm to ensure standardization across our formations. Additionally, Maj. Gen. Virgil L. Packett put the onus on DES to identify trends in our branch. What we've seen through the course of our visits are aviation units with some absolutely amazing accomplishments. However, we've also seen negative trends that we believe have the potential for damaging the long-term readiness of our branch.

One of the most common negative trends we continue to find is the excessive use of waivers. As we settled into the fast pace of this war, we changed Army Regulation (AR) 95-1, *Flight Regulations*, to give brigade commanders the authority to grant unit waivers. We also gave them the authority to establish their own self-start training date upon their return from theater because of the backlog of aircraft in RESET and PRESET. Many commanders never established the start training date. As a result, we've had, and still have, aviators leaving one unit with a waiver of all aircrew training program/annual proficiency and readiness test (ATP/APART) requirements and joining another unit preparing to deploy and requiring yet another unit waiver. We're growing a generation of aviators who are very good at conducting operations in a narrow mission set, but are not as well rounded as our aviators prior to this war. We have captains in the Captain's Career Course and IP candidates at Fort Rucker who have never completed an APART in their careers.

Some of the areas we find that are routinely weak are instrument and gunnery skills. Weak instrument skills are probably not a surprise to you because we all know how difficult it is to train instrument tasks in combat. Atrophy of gunnery skills

FYI

A team of personnel from the U.S. Army Aviation Warfighting Center Directorate of Evaluation and Standardization, supported by the U.S. Army Combat Readiness/ Safety Center, have just returned from Iraq. They were heavily engaged in conducting assistance visits with multiple aviation brigades and will be providing an update to the field in an upcoming edition of *Knowledge*.



in combat is counter-intuitive, but it is real. Crews are not necessarily employing their weapons systems routinely and when they are, their videotaped engagements aren't always critiqued by an experienced aviator in the unit. Surprisingly, although we find weak instrument and deteriorating skills, we still see units with low utilization rates of their simulation devices.

The Results

Some might say that much of what I've mentioned above just doesn't matter; we're training our aviators on the tasks they need to execute in combat and that is good enough. However, this statement is only partially correct. Yes, we train our aviators for Iraq if they are deploying to Iraq and for Afghanistan if they are deploying to Afghanistan; but we are still losing aircraft and Soldiers in places like Alabama, Georgia, Tennessee, Texas, Utah and Europe. Some of these accidents are due to inadvertent instrument meteorological conditions (IIMC) by aviators lacking instrument proficiency, while others are due to human factors by aviators whose skills have eroded, who lack discipline or who have just become complacent. I believe many of these accidents can be traced back to the "Realities of GWOT."

What Can We Do to Break the Cycle?

If the realities of GWOT are the root cause of our accident trends, then what can be done to break the cycle? We can't call a timeout. The enemy has a vote in that. We may not be able to completely change the realities of GWOT, but aviation leaders at all levels can influence them by understanding we are in this war for the long haul and we can't continue to simply meet the immediate needs of combat.

Professionally Develop our Warrant Officers

We must send our experienced PCs to schools so we aren't caught in an endless cycle of never having enough IPs, MTPs, TACOPS and safety officers. If we fail to send our aviators to professional schooling, we will never have enough trained instructors to progress our young aviators. The same logic applies to our test pilots; if we don't grow them, we end up having to use them as mission pilots, and then lean on them to do their MTP and maintenance test flight evaluation duties in the short time between missions.

Continue to Train in Combat

We have to get our aviators into our simulation devices, even if it means putting them in an aircraft and flying them to the device. Simulation devices provide the only means to practice multiple, simultaneous emergencies in an aircraft, and they are one of the best tools for helping prepare our aviators for potential IIMC situations. We must ensure our junior aviators are periodically being paired with more experienced aviators. By doing that, you are, in effect, carrying out a No-Notice program. Sometimes the only time a junior aviator gets to fly with a chief warrant officer 4 or 5 during a deployment is when a DES standardization IP shows up for a

visit. Additionally, we must continue to conduct aircraft and door gunnery training, even while we are deployed.

RESET Our Aviators

When our units redeploy, we must ensure our aviators are fully prepared to return to the airspace they will train in. The only real way to determine if they are ready is to give them a proficiency flight evaluation. However, being ready isn't just being able to fly the aircraft; it also includes understanding the airspace and weather patterns of your home station.

Finally, we must get back to the basics and make sure leaders and trainers at all levels are enforcing the standards that have made our branch so successful. We have to remember the ATP is a training program, not just another requirement to be met. We must give our aviators the opportunity to conduct as many of the requirements set forth in AR 95-1, Training Circular 1-210, *Aircrew Training Program Commander's Guide to Individual, Crew, and Collective Training*, and our aircrew training manuals as possible, in garrison or in combat. This will not only ensure we have well-rounded aviators, but also allow our branch to continue providing our Soldiers the capabilities they have come to rely on in combat. ■

YOU DOWN WITH PPE?

DENNIS KEPLINGER
U.S. Army Combat Readiness/Safety Center
Fort Rucker, Ala.

As a worker was filling a small container with acid from a large drum, the chemical splashed off the bottom of the container and into the worker's eyes. After flushing his eyes at the worksite, he was treated at the emergency room. The worker suffered permanent damage to his vision in one eye and lost several days of work. At the time of the accident, he was not wearing eye protection, as required by signs posted at the worksite, and his supervisor did not enforce the standard.

A supervisor once told me he was having a problem getting his employees to wear their personal protective equipment (PPE). Common excuses included the PPE didn't fit properly or was uncomfortable or the safety goggles were dirty. Employees also claimed they were in too much of a hurry to put on PPE and had an "it-won't-happen-to-me" attitude toward accidents. My response to the supervisor was, "Well, can you get them to come to work on time?"

Supervisors have a responsibility to enforce safety standards. When employees understand the hazards, have properly fitted PPE and are adequately trained how to use it, they are more likely to perform to the standard. In areas where PPE is required to provide protection against a hazard, its use is not optional; it's a part of job performance.

When to Use PPE

Often, PPE serves as the last line of defense between the worker and a hazard. Where feasible, engineering or administrative controls are used to eliminate or reduce hazards. However, for many operations, PPE is essential. Such operations include grinding, chipping, welding, handling or dispensing chemicals, painting or other tasks where workers may be exposed to chemicals, dust, fumes or other hazards with a potential for injury or occupational illness.

PPE Selection

PPE is selected based on the hazard(s) and work environment to provide protection against the highest level of each hazard. For example, acid and chemical handling may require use of chemical-protective goggles and a face shield to protect the eyes and face, as well as a protective apron or chemical-protective coveralls and gloves. However, protective devices may not necessarily provide all the needed protection. In addition to PPE, barriers, shields, guards and other engineering

controls must also be installed and maintained. Consult with safety and industrial hygiene professionals as necessary to determine the hazards and appropriate protective equipment.

Fitting and Training

Once the correct PPE is selected, each user must be fitted with the equipment and given instructions on its proper care and use, including warning labels and limitations. Occupational Safety and Health Administration standards require that users demonstrate they understand the instructions and are able to properly use the PPE. Supervisors should maintain training rosters or other documentation of training and provide updates or retraining as necessary to maintain competency.

Maintenance

Instructions for maintaining PPE are provided with the product packaging. If goggles or face shields are dirty, cloudy or so scratched that vision is impaired, employees are unlikely to use the equipment. No one wants to share a respirator that was worn by someone else and left covered with grunge. Follow the manufacturer's instructions for cleaning so the equipment is immediately available when needed.

Using PPE properly is essential to job performance and injury prevention. The habits learned on the job should also carry over to activities off the job. Protect yourself; wear your PPE. ■

CE HAZARD ASSESSMENT

Personal protective equipment is provided to protect against specific hazards identified through a workplace hazard assessment. This assessment normally includes a walk-through survey of the workplace to identify sources of hazards to workers, co-workers and visitors. The assessment should consider the basic hazard categories (as well as the possibility of exposure to several hazards at the same time):

- **Sources of motion (moving machinery or parts)**
- **Impact (falling or flying particles)**
- **Penetration (sharp objects, tool blades, sharp edges)**
- **Compression (rolling or pinching objects)**
- **Chemical exposure**
- **Biological contamination (blood-borne diseases)**
- **Heat or cold**
- **Harmful dust**
- **Light (optical) radiation**
- **Electrical hazards**

Note: Maintain written documentation of the hazard assessment and reassess workplace hazards as necessary to address new equipment or processes and to correct accident causes. The job hazard analysis is a commonly used tool to conduct the hazard assessment. Employee buy-in is more likely to occur if they are involved with identifying and assessing the workplace hazards.

GETTING PROPERLY "HITCHED"

PERRY WILDS
U.S. Army Combat Readiness/Safety Center
Fort Rucker, Ala.

As a kid growing up in south Florida, we used to go down to the boat ramps on weekends to see just how funny some people could be. It wouldn't be long before someone would show up towing a 28-foot cabin cruiser with an expensive car.

Although watching people try to back their new boat down the ramp was funny, watching them try to pull it out of the water was downright hilarious. Something about weight versus thrust versus traction. I'm not sure if that's a scientific formula, but I do know that people hate when kids laugh at them while their car is sinking. Hey, what can I say; we didn't have video games back then.

Ask anyone who regularly pulls a trailer and they will have at least one story about a trailer coming off its hitch, pushing them through a busy intersection, losing its brakes or suddenly getting blown into another lane of traffic. Most of these stories have a humorous side and an uneventful ending. For inexperienced drivers, however, some of these events end in disaster.

Here are a few things to consider before you tow a trailer:

> **"MAKE SURE your TRAILER HITCH is the RIGHT 'CLASS.'"**

- Know the towing capacity of the vehicle you will use to tow your trailer.
- Know the weight capacity of your trailer, trailer ball and trailer hitch.
- Know the proper technique for loading items in your trailer.

Let's break this down into three main areas: the tow vehicle, the trailer and weight distribution.

The Tow Vehicle

The tow vehicle and hitch must be capable of safely handling at least 15 percent of the gross weight of the trailer (total weight of the trailer plus contents). Fifth wheel trailers normally can carry up to 25 percent of their gross weight on their hitch. However, if you load a cargo trailer with all your household goods, hook it to your pickup and the headlights are aimed at the treetops, it may be a clue something is wrong.

Make sure your trailer hitch is the right "class." If you didn't know, there are five classes of trailer hitches—each designed to handle a certain maximum tongue weight and gross trailer weight. What can your vehicle handle? Maybe now is a good time to actually read your owner's manual. If you didn't know your vehicle had an owner's manual, maybe towing a trailer isn't for you. You also need to make sure your trailer ball

is the correct size and weight capacity. Yes, you could put a 1.5-inch trailer ball in a 2-inch receiver, but having your trailer pass you in traffic is seldom a good thing.

The Trailer

Know what the maximum gross weight of your trailer should be. The ball should be located so the trailer sits level when connected to the tow vehicle. Safety chains should be long enough so you can make tight turns without the chains binding and be crossed (right to left and left to right). This will help create a "saddle" if the tongue fails and will help maintain control while stopping. Be careful not to allow these chains to drag on the pavement as they can be ground down and weakened in a very short amount of time. Also, don't forget to retract the jack or stop halfway through the process of hooking up your trailer—you just might forget to finish the job! In addition, don't ever leave the receptor pin out of your trailer hitch—not even for a minute. And "NO," a screwdriver is not an acceptable substitute for a receptor pin in any circumstance!

Other important things to check are the wheels and lug nuts, wheel bearings, vehicle and trailer brakes and trailer lights.

Weight Distribution

This is one time where putting 10 pounds of junk in a 5-pound bag is not a good idea. When towing a trailer, it is critical to know how much weight you're towing and how it is distributed. Knowing how much weight you're towing allows you to determine if it is within the capacity of your vehicle. Making sure that weight is properly distributed in the trailer is critical to the way your rig will handle on the road.

While it would be easy to just put the heavy items over the axles, that doesn't always work. Sometimes a lot of little items can far outweigh a single large one. Also, top-heavy loads can cause problems when cornering and during hard braking. During hard braking, top-heavy loads tend to make the trailer "dive." This increases weight on the tongue while decreasing weight on the front axle just when you most need to steer and brake effectively. Center top-heavy items, or arrange the remainder of the load to act as a counterweight to minimize this effect.

Overloading a trailer beyond its rated capacity, even though it may be well balanced and seem to handle fine, is a very dangerous practice. Eventually, something is bound to fail—often with

dramatic and unpleasant results. What do I mean by dramatic and unpleasant? Just imagine your trailer coming loose and crashing into the free beer stand at a biker rally. You get the picture.

Your Responsibilities as a Driver

Towing a trailer imposes responsibilities similar to properly driving your car. You wouldn't think of letting your 10-year-old child practice driving during rush hour while text messaging a friend. Then why would you try to learn how to handle a trailer by fully loading it and taking it onto a busy road? Towing skills have to be developed, and the responsibility to be safe is one that should not be taken lightly.

Things to Know Before You Tow

- Use your transmission and brakes when pulling heavy loads up and down hills.
- Use extra care when parking on an incline; remember your trailer doesn't have a parking brake.
- Know what to do if your trailer begins to sway. Driving in windy conditions can make it difficult to stay in your lane on the road. Understand how the airflow from a passing tractor-trailer can affect your trailer and be ready for it.
- Perhaps the hardest skill of all—learn when it's best not to tow a trailer. «

I SHOULD'VE LISTENED

BOB VAN ELSBERG
U.S. Army Combat Readiness/Safety Center
Fort Rucker, Ala.

Ever have trouble taking advice because you thought you knew better? I made that mistake the first time I tried towing a trailer on a cross-country trip.

It was December 1995 and I was towing a 5-by-10-foot trailer with a 1993 Toyota pickup. We're talking a 2.4-liter, four-cylinder engine with 113 screaming squirrels under the hood. The owner's manual said I could tow up to 3,500 pounds, and the fully-loaded trailer was supposed to max out at 2,800 pounds. I figured this would be no problem.

In one of my few lucid moments, I had the presence of mind to drive over to the dealership and ask their advice on how to handle this chore. I was, after all, driving from Georgia to New Mexico—a bit more challenging trip than hauling my johnboat to the lake.

The service manager advised me to stay out of fifth gear in my manual transmission. "OK," I said, mentally filing away this nugget of information in my "try-not-to-forget" file.

Anyway, once I got through Georgia and north of Birmingham, Ala., the roads leveled out. I figured, "Why not drive it in fifth? Everything seems to be OK. Maybe I can stretch a gallon of gas a mile or two further."

I was happy as a clam going westbound on Interstate 40 out of Memphis, Tenn. The little Toyota was ticking off the miles lickity-split. Shoot—I was even passing traffic! And to think, it was just me and my piddlin' little four-banger Toyota pickup.

After a stopover to spend Christmas with my folks in Little Rock, Ark., I was back on the road again. As I neared the Oklahoma border, I noticed my right foot was getting warm. When I put my hand on the transmission hump, it was scorching hot—I thought my engine was on fire!

I immediately pulled off the road and turned off the ignition. I ran around the truck to the shoulder and peered underneath the engine compartment, half expecting to see flames. Fortunately, there weren't any.

I let things cool off a bit and then drove to an exit and pulled off for dinner. About then, I recalled that little piece of advice the Toyota dealership service manager gave me. Since I couldn't find anything wrong with the truck to cause it to run hot, maybe it was something about running it in fifth gear.

When I got back on the road, I followed the advice and didn't go above fourth gear. It turned out the advice had been sound. My transmission hump stayed cool and, wonder of wonders, I actually got better fuel mileage! I guess it was like when I was a kid trying to peddle a 10-speed bike uphill in too high a gear. I bogged down and my legs ached—which is pretty much what I was doing to my truck's engine by running it with a heavy load in high gear.

Hmm … maybe I'll listen the next time someone knowledgeable gives me advice about towing! ■

RIDING SAFE

EARNEST EAKINS
U.S. Army Combat Readiness/Safety Center
Fort Rucker, Ala.

It ought to be illegal for the bad actions of a few people to hurt the freedoms of many. Yet, that is exactly what is happening in the good ole USA among motorcyclists. The few that fail to wear helmets or choose to ride recklessly are causing insurance rates to skyrocket for the rest of us.

...ears Riding Free

And that's not the worst of it. It is rumored that performance limitations may be placed on motorcycles. For example, we may see mandatory speed and horsepower limits. Right now, most of us aren't willing to risk further controls being caused by the reckless nature of our brother and sister bikers. The problem is these changes may be forced upon us if we don't do something about the problem.

I recently read an article by Kent Kunitsugu in the December 2007 issue of *Sport Rider* magazine in which he said, "Sportbikes don't kill riders, and they are no more dangerous than other motorcycle types." He is correct in both instances. Like the old gun control argument, "Guns don't kill people—people kill people;" sportbikes don't kill riders, inexperienced riders kill themselves.

There is a popular misconception that most riders are killed by other motorists rather than as a result of their own mistakes. However, that's not what the facts show. Sportbike accidents currently account for 87 percent of Army motorcycle fatalities. Of that number, very few involved a second vehicle. This problem is not limited to the Army; the other services are seeing the same trends.

How can we deal with the speed and skill-based errors that are killing our riders? Although education is a big part of the answer, it is not the stand-alone solution that many are looking for.

There is a distinct difference between riding fast and riding well. To improve a rider's skills involves both educating and encouraging them to make better decisions. To do that, riders need a safe environment where they can measure their skills against their machines' performance. One of the best ways to do that is through track days where riders can go fast while also being safe. Track days expose a rider to a structured environment that is liberated from the free-for-all mentality of the street or the dogfight mentality of racing.

"SPORTBIKES DON'T KILL riders, **INEXPERIENCED** riders **KILL** themselves"

FYI

Interested in finding out just how good you could be on a sportbike? How about twisting the throttle and digging deep in the turns on the Talladega Grand Prix Raceway and other great tracks in America? Just visit the Northeast Sportbike Association's (NESBA) Web site at http://www.nesba.com/ to check out the opportunity nearest you. Want to keep climbing the learning curve as a rider? Check out the Motorcycle Safety Foundation's Web site at http://www.msf-usa.org/. You'll find training opportunities to hone your skills both on and off the road.

Many riders are reluctant to admit their shortcomings until their skills are tested on a track. While sportbikes are no more dangerous than other motorcycles, they are capable of much higher speeds and handle and brake differently compared to other bikes. Unfortunately, without the experience of riding on a track, many riders aren't safely exposed to those differences.

Kevin Schwantz, 1993 500cc world champion, believes that while great motorcycle riders are born, others can be taught the skills to succeed. In an article in the August 2007 issue of *Rider* magazine, Schwantz told a riding class, "We're not here to make one more racer; we're here to save one more life." Amy and Paul Kobussen, sportbike riders who had completed a track day, said that after the experience they no longer felt the need to ride as fast on the street.

As riders, if we care about our sport, we must take a serious look at its safety record. Since most of our accidents are single-vehicle crashes, it is evident Soldiers can benefit from track day experiences. Track experience has nothing to do with age or maturity. Rather, it has to do with riders understanding their capabilities and limitations, along with those of their sportbikes. Not recognizing those factors has contributed to many sportbike accidents.

This brings us back to the point of this article. We must confront the problem of riders taking unnecessary risks on the street. Those of us who have experienced a track day have a duty to mentor those who haven't. We need to offer Soldiers a chance to hone their skills on a track before they become statistics in our database. If we fail to do that, we could face restrictions that would forever change the face of motorcycling. It's time for all of us who ride to become part of the solution rather than part of the problem. «

PENTAGON TO HOST MOTORCYCLE EVENT

The 2008 National Capital Region Joint Services Motorcycle Safety Event is scheduled for May 2 and 3. The event, which will be held in the north parking lot of the Pentagon, will include a motorcycle skills demonstration, motorcycle rodeo and a best bike contest. In addition, the Motorcycle Safety Foundation will demonstrate its Safe Motorcyclist Awareness and Recognition Trainer (SMART). The event will end on May 3 with a group ride.

The event will open with a discussion of current trends in motorcycle accidents and their effect on military readiness by Tad Davis, Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health. The event's goal is to raise motorcycle safety awareness, provide a model safety awareness day that can be adapted for use at other installations and showcase Department of Defense and industry safety initiatives.

The motorcycle skills demonstration will include braking tests, maneuvering in tight locations and turning skills to avoid highway hazards. The motorcycle rodeo will include a slow-ride drag race to determine which rider can best maintain control at low speeds. In addition, there will be a course where riders will weave as quickly and smoothly as possible through a series of cones and then attempt to stop with their front tire inside a 2-foot-square box.

Riders interested in participating can register online at http://www.upcomingevents.ctc.com/NCRJS_MotorcycleSafetyEvent_registration.htm. Registration closes May 1.

For more information, contact the U.S. Army Combat Readiness/Safety Center at 334-255-3039 or DSN 558-3039. A short video of last year's event can be viewed at https://crcapps2.crc.army.mil/dtfnewslette~/docs/Pentagon_Event_Army.wmv.

MATCH THE RIDER TO THE RIDE

STEVE KURTIAK
U.S. Army Combat Readiness/Safety Center
Fort Rucker, Ala.

If you have a youngster who is about ready to ride an all-terrain vehicle (ATV), there are special considerations you should keep in mind. Although a child may be the recommended age to ride a particular size ATV, not all youngsters have the strength, skills or judgment needed to operate one. You should supervise your youngster's operation of the ATV at all times and permit continued use only if you determine they have the ability and judgment to operate it safely. You should read *Parents, Youngsters and All-Terrain Vehicles*, which is available from the All-Terrain Vehicle Safety Institute (ASI). You can locate the pamphlet and an ordering form online at http://www.atvsafety.org/. For more information about ATV safety, visit ASI's Web site or call the Consumer Product Safety Commission at (800) 638-2772 or the Distributors' ATV Safety Hotline at (800) 852-5344.

"SUPERVISE riders YOUNGER THAN 16; ATVs are not TOYS"

Before You Ride

The ATV Safety Institute's Golden Rules:

1. Always wear a helmet and other protective gear.
2. Never ride on public roads because another vehicle could hit you.
3. Never ride under the influence of alcohol or other drugs.
4. Never carry a passenger on a single-rider vehicle.
5. Ride an ATV that's right for your age.
6. Supervise riders younger than 16; ATVs are not toys.
7. Ride only on designated trails and at a safe speed.
8. Take an ATV RiderCourse; call toll free at 800.887.2887, or go to www.atvsafety.org.

Proper Riding Gear

- Approved helmet—Helmets should have stickers on the inside or outside confirming compliance with the standards of the U.S. Department of Transportation or the Snell Institute
- Eye protection—Protective goggles or face shield
- Gloves—Off-road style is best
- Long-sleeved shirt/jacket—Off-road jersey; shoulder pads/chest protector are encouraged
- Over-the-ankle boots—Off-road-style, over-the-ankle ATV boots offer the best protection

Be a Responsible Rider

The ASI encourages riders to always:

- Know the state laws and respect the environment and rights of others.
- Remember that riding an ATV is a privilege and it is our responsibility as riders to ensure we ride responsibly and wear the proper personal protective equipment at all times.

Editor's Note: The information for this article was provided courtesy the ASI, a not-for-profit division of the Specialty Vehicle Institute of America.

DASAF CRM AND GUARDIAN AWARDS ANNOUNCED FOR 2007

TAYLOR BARBAREE
U.S. Army Combat Readiness/Safety Center
Fort Rucker, Ala.

Brig. Gen. Bill Forrester, director of Army safety (DASAF) and commanding general of the U.S. Army Combat Readiness/Safety Center, recently announced the recipients of the DASAF Composite Risk Management Award and U.S. Army Safety Guardian Award for 2007.

"These awards showcase heroic acts by units and individuals in preventing Soldier and Civilian losses in our formations, as well as in the Army workplace," Forrester said. "I appreciate the efforts made by the submitting units in recognizing these outstanding individuals and units."

The 3rd Infantry Division (primarily based at Fort Stewart, Ga.) and 2nd Battalion, 502nd Aviation Regiment (Coleman Barracks, Germany), earned the DASAF Composite Risk Management Award, which is given to organizations or individuals who have made significant contributions to Army readiness through composite risk management (CRM). Submissions can be forwarded any time during the year.

According to Forrester, the 3ID demonstrated exemplary leadership and employed the tenants of composite risk management to reduce the command's accident fatality rate.

"The command implemented proactive measures such as focusing on motorcycle safety, clearing tree-lined roads and installing safety signs, renovating an off-duty facility on the installation for Soldiers in an effort to combat drinking and driving, and emplacing an extensive safety message campaign," Forrester said. "This dedication to safety awareness and the preservation of vital Army resources deserves recognition."

The 2-502nd Aviation Regiment showcased its muscle and skill by moving the 82nd Combat Aviation Brigade and 10th Mountain Combat Aviation Brigade aviation assets at Rota, Spain from Dec. 27, 2006, to Feb. 20, 2007. The Soldiers, civilians and contractors of the 2-502nd loaded and unloaded 50 C17s to move 100 helicopters to and from theater using three ships and working more than 7,600 man hours in order to support the unit. The 2-502nd used the five-step CRM process to safely execute its mission without experiencing a Class A, B, C or D accident.

In addition to the 3ID and 2-502nd, Mr. Se-Hwan Pak, Installation Management Command-Korea Morale (IMCOM), U.S. Army Garrison, Camp Humphreys, Korea; Mr. Michael B. Moore, U.S. Army Space and Missile Command, located at Redstone Arsenal (Huntsville, Ala.); IMCOM-Korea Morale Welfare and Recreation; and the 82nd Airbone Division (Fort Bragg, N.C.) were awarded the Composite Risk Management Safety Award.

Pak, a Korean national safety specialist, translated numerous safety documents from English to Korean, including Army Risk Assessment Program (ARAP) questions, a CRM power point presentation and the IMCOM-Korea 2007 Summer Safety Campaign that incorporated CRM.

From December 2006 through August 2007, Moore directly applied CRM methods and tools in field and garrison

environments to protect Soldiers, civilians and the public. His efforts helped create a new civilian CRM training course.

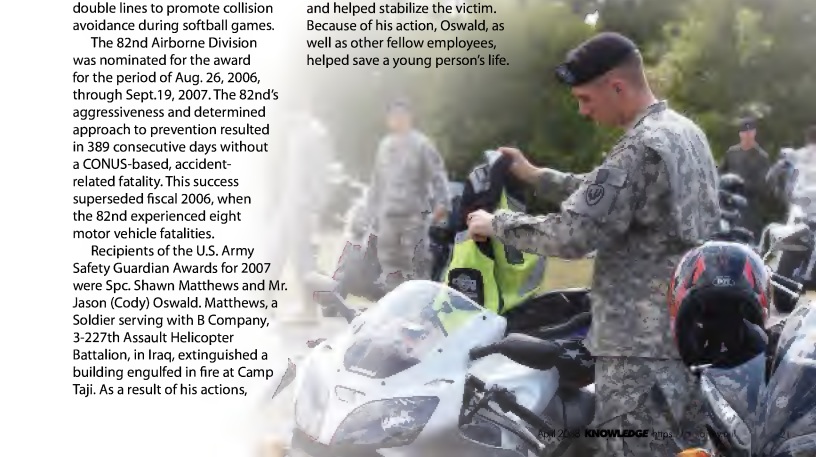
In 2007, IMCOM-Korea Morale, Welfare and Recreation started an aggressive sports safety awareness program by enforcing the use of personal protective equipment, installing breakaway bases to reduce ankle injuries and implementing the use of double lines to promote collision avoidance during softball games.

The 82nd Airborne Division was nominated for the award for the period of Aug. 26, 2006, through Sept.19, 2007. The 82nd's aggressiveness and determined approach to prevention resulted in 389 consecutive days without a CONUS-based, accident-related fatality. This success superseded fiscal 2006, when the 82nd experienced eight motor vehicle fatalities.

Recipients of the U.S. Army Safety Guardian Awards for 2007 were Spc. Shawn Matthews and Mr. Jason (Cody) Oswald. Matthews, a Soldier serving with B Company, 3-227th Assault Helicopter Battalion, in Iraq, extinguished a building engulfed in fire at Camp Taji. As a result of his actions, Matthews prevented possible loss of life and injury, as well as extensive financial damage to the area where the fire originated.

Oswald, employed as the head lifeguard of the U.S. Army's IMCOM at Fort Sam Houston, Texas, applied lifesaving techniques during a near drowning at the post's aquatic center. After an unresponsive teenager was pulled from the water to safety, Oswald rendered CPR and helped stabilize the victim. Because of his action, Oswald, as well as other fellow employees, helped save a young person's life.

The U.S. Army Safety Guardian Award is presented by the DASAF to individuals who, through extraordinary individual action in an emergency situation, prevent an imminently dangerous situation, prevent injury to personnel or minimize or prevent damage to Army property. Nominations should be submitted as soon as possible after the occurrence of the event.



IN THE THICK OF IT ALL

SURVIVING

CHRISTINA MARTIN
Aviation Aftermarket Defense
Mt. Kisco, N.Y.

U.S. military helicopter crews have faced their worst nightmare in the Middle East: brownouts. Now it is up to the military to develop innovative solutions to eliminate the threat that comes with 0/0 conditions.

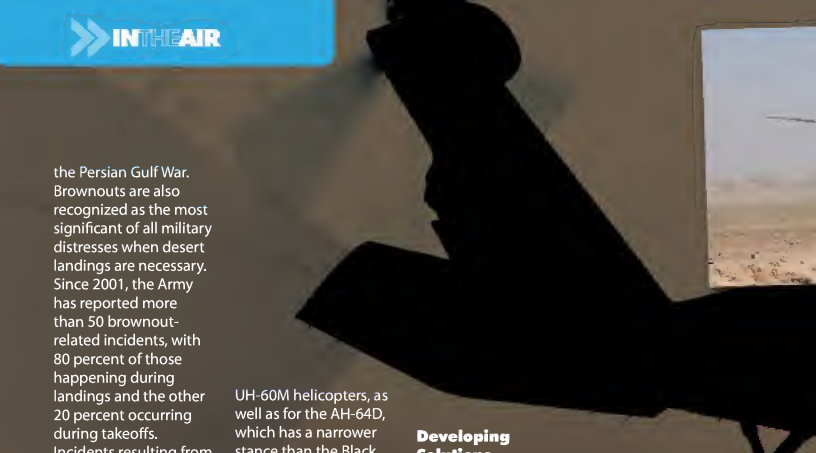
THE BROWNOUT

Picture this: You're a mere 75 feet from landing your helicopter in the middle of nowhere. The terrain below you is arid desert, and there isn't enough room to perform a roll-on landing.

Within moments, your helicopter's rotor downwash begins to stir up dust. As you approach, the cloud of sand, dust and debris starts building from the rear, moving forward from the tail wheel and past the cabin door to crew window, engulfing your aircraft.

You're only 10 feet from the ground, but you cannot see anything outside of the cockpit. Conditions are 0/0 (zero ceiling/zero visibility). The dust outside the cockpit window is swirling and creating an illusion that makes you feel like the chopper is spinning. Without any visual cues, you are no longer able to see potential obstructions in the landing zone. Landing at this point is a dangerous risk—you could crash or, even worse, your crew could be seriously injured.

This scenario is known as brownout, and it has been a known hazard within the military since before



the Persian Gulf War. Brownouts are also recognized as the most significant of all military distresses when desert landings are necessary. Since 2001, the Army has reported more than 50 brownout-related incidents, with 80 percent of those happening during landings and the other 20 percent occurring during takeoffs. Incidents resulting from brownout are several times more likely to happen at night when crews are wearing night vision goggles, as the crews' peripheral vision is already drastically reduced.

Naturally, there has been increased emphasis on training, tactics and emergency procedures for brownout scenarios to help decrease incidents. However, this phenomenon remains one of the leading causes of helicopter accidents, with about three out of every four mishaps caused by excessive dust and dirt roused by the helicopter rotors. Brownouts are especially dangerous for heavier aircraft such as the CH-47 and UH-60M helicopters, as well as for the AH-64D, which has a narrower stance than the Black Hawk and is more susceptible to rollovers.

Although the problem was recognized in the 1990s, the Army only began categorizing brownouts as a major safety hazard in 2003. As such, the military has spent as much as $1 million a year trying to alleviate the problem by developing countermeasures ranging from new technologies for the aircraft to new ways of preparing a landing site. The military's goal has been to generate effective solutions in the shortest possible time frame to prevent more casualties while minimizing the cost of developing and implementing such solutions.

Developing Solutions

Today's deployed helicopter pilots do the best they can to cope with brownout conditions. They use roll-on landings (extending the landing for as long as the terrain and obstacles allow) and rely on their crews to call out the dust as it moves from the rear to the front of the bird. If the crew is lucky enough to be landing at a predetermined — and, presumably, friendly — site, preparing the landing zone is an option. This can be done by chemically treating the landing area with sprays that hold down the dust or by laying down transportable landing mats.

Unfortunately, more often than not, a landing is not planned. Missions may include medical evacuations (MEDEVAC) rescues, as-needed supply drops or unscheduled troop transports. In such cases, there is little to no time for an extended roll-on landing or for preparing the landing site. So what's a crew to do?

Some ideas have included changing the design of the helicopters to be more aerodynamic or otherwise altering related technology. Naturally, creating a workable redesign of a helicopter could take years and involve huge costs, so adding to the existing technology is the preferred approach. "Significant funding has been spent on developing technology

> "Since 2001, the Army has reported more than **50 BROWNOUT-RELATED INCIDENTS**, with **80 PERCENT** of those happening during **LANDINGS** and the other **20 PERCENT** occurring during **TAKEOFFS**."

to minimize the impact of brownout conditions," said Kim Henry, a public affairs specialist with the U.S. Army Aviation and Missile Command at Redstone Arsenal, Ala. To most efficiently reach a solution, the various branches of the military are working together. "Communication is critical among the services to efficiently leverage ongoing efforts that further advance the technology," Henry said.

The most basic of the technological solutions that are currently available to pilots is flight symbology. Flight symbology assists pilots during low-visibility situations and varies in complexity. An example of its simplest form is the system used on the Air Force's MH-53 helicopter. In the middle of the heads-down display is a box. A cross comes off the top of the screen at 15 knots, and the pilot decelerates and walks the cross down to the box as a way to monitor the helicopter's vertical velocity.

The Army's brownout situational awareness upgrade (BSAU) took flight symbology to the next level. Phase 1 of the upgrade resulted in a liquid crystal display that maps acceleration cues, radar altimeter height and vertical speed and vector. For further precision in the hover display, engineers added a global positioning system (GPS) with the radar altimeter on the UH-60 and CH-47.

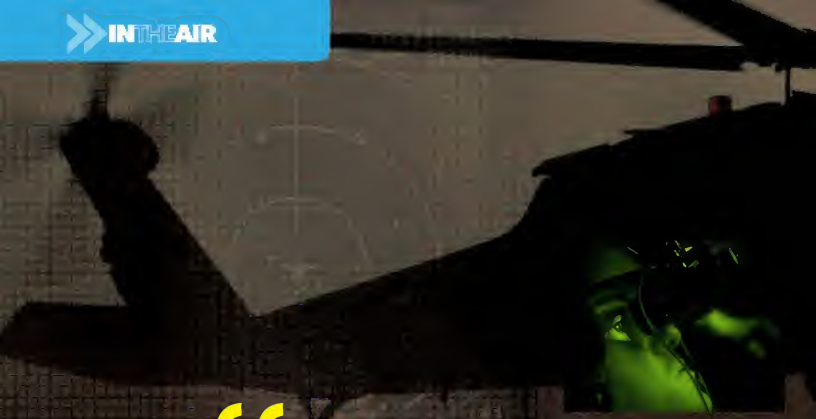
After successful testing in 2004 at Yuma Proving Ground in Yuma, Ariz., the Army decided to upgrade its new Chinooks and Black Hawks with this system. Unfortunately, because of funding constraints, BSAU did not continue through the originally planned Phases 2 and 3.

Seeing Through the Dust

The situational awareness upgrade has been valuable in terms of upgrading outdated aircraft. However, the Army's BSAU still does not solve the problem of vision impairment during brownout.

So this is where "see-through" technology steps in — one of the most sought-after features of a successful brownout solution. See-through means just what it implies: With the help of specialized technology, pilots will be able to see through the massive dust cloud otherwise erasing their view of the ground, giving them the ability to land safely. One program to integrate see-through is the Sandblaster initiative, sponsored by the Defense Advanced Research Projects Agency (DARPA). The Army, Air Force and Marines are involved in this project to varying degrees.

The Army holds a consulting/monitoring role on the project. Henry said the approach integrates four distinct, but



interrelated, advanced concepts, including:

- A radar sensor for three-dimensional, see-through scanning; "[The radar] sends out radio frequency pulses and receives the returns from objects in the field of view," Henry said. Using algorithms, the scans are processed as three-dimensional images (in contrast to the type of two-dimensional image produced by standard radar).
- A database that captures and integrates the image produced by the scans with a stored image of the surrounding terrain.
- An advanced, three-dimensional, synthetic vision system with predictive state-of-the-art aircraft information to restore the pilot's lost visual cues, creating a realistic and intuitive view of the outside environment.
- An agile flight-control system tailored for low-speed helicopter operations during landing, giving the pilot the option to let the helicopter land itself.

> "The most **BASIC** of the **TECHNOLOGICAL SOLUTIONS** that are **CURRENTLY** available to pilots is **FLIGHT SYMBOLOGY**."

With these advanced technologies, the pilot would have a depiction of the world outside and, theoretically, would be able to point the helicopter in the direction of safety.

Currently, the Sandblaster initiative is exploring the use of millimeter wave radar as its sensor, as this form of radar has been shown to provide increased visibility through dust. Flight testing is expected to begin in late 2008. If all goes well, this see-through technology will be the first semi-automated system of its kind.

Similar in theory, the Air Force has been working toward its own solutions, the most promising being its laser radar, or LADAR, technology. "Essentially, [LADAR] is taking three-dimensional pictures with cameras," said Dr. William Humbert, program manager at the Air Force Research Laboratory (AFRL), which is responsible for the Air Force's science and technology program. "Every pixel is measuring the range to target, which allows for obstacle detection and ground slope indication."

The LADAR technology works by using its laser beams to scan the ground and process a signal that is bounced back, thus creating a virtual picture of the area. The technology has the ability to map out the broader topology of a city or geographic area from a large distance away. Closer up, LADAR can pick up the surface structure of any single object.

So far, the AFRL has seen promising results with the LADAR system. After successful testing trials at Yuma, sponsored by Sandblaster, the AFRL expects to perform a flight-based test by the end of the year. Humbert believes the system has "a lot of potential." "Compared to other [systems], it's more complete," he said.

After flight-based tests are performed, the remaining phase before implementation is to finalize the design of the system. "It's really just engineering issues that are left (to be worked out)," Humbert said. When complete, the LADAR technology will be a self-contained system that can be installed on any model of rotorcraft, with an estimated per-unit cost of $200,000.

Other technology in the works by the AFRL is the photographic landing augmentation system for helicopters (PhLASH). Unlike LADAR, PhLASH can be compared to a conventional camera in that PhLASH creates two-dimensional pictures rather than three-dimensional images, Humbert said.

PhLASH uses the "see-and-remember" concept, which ideally would be applied during the helicopter's final approach but before brownout. On approaching the landing site, the system would take several high-resolution images of the landing area using an infrared digital camera and then adjust the images to real time as the helicopter descends. In other words, as the helicopter descends, the image "zooms in" to create the illusion of approaching an object. PhLASH uses a combination of an electro-optical sensor and infrared strobe lights to match the photograph of the ground with a coordinate on the Earth's surface using the onboard GPS.

The downside to PhLASH is the time between the photo last taken and landing is about 20 seconds. Although it is unlikely, there is always a chance that some sort of obstruction might enter the landing zone in these final seconds. The cost of PhLASH would be about $150,000 to install one unit.

Landing Without a Hitch

After more than a decade of flying in arid environments, pilots soon may be able to land and take off in the middle of a dust cloud without breaking a sweat. It has been years since brownouts were first recognized as a major hazard, but the military seems to be within reach of a solution, whether it's LADAR, PhLASH or something different.

It remains to be seen what the government will decide to do in terms of implementation and funding. But it is predictable that roll-on landings and dust calling are soon to be a thing of the past. Technologically advanced helicopters providing improved safety for our airmen will mark the future. ■

—Reprinted with permission from Aviation Aftermarket Defense magazine. For a complimentary subscription to AAD, please contact Richard Greenwald, Publisher, at r.greenwald@abdonline.com or call 914-242-8700, ext. 1.

THE DEATH ZONE

LT. COL. IAN CURRY AND FRED BROZOWSKI
U.S. Army Aeromedical Research Laboratory
Fort Rucker, Ala.

In current U.S. Army operations, rotary-wing aircrews can be repeatedly exposed to moderately high altitudes (up to 18,000 feet pressure altitude), making hypoxia and its performance effects, a real hazard.

Hypoxia is a reduction in the amount of oxygen available to your body and, most importantly, your brain. Oxygen is used at the cellular level as fuel, and without enough fuel, the cells do not function optimally and the body and brain can both suffer. Climbers who go to very high altitudes talk about the "death zone" above 26,000 feet where they begin making errors—sometimes catastrophic. Most aviators have had some altitude chamber training up to 25,000 feet and can relate stories about their less-than-optimal thinking and behavior patterns after three or four minutes off oxygen.

During routine aviation medicine training, rotary-wing aircrews are typically told the impact of hypoxia from flying in unpressurized cabins up to 10,000 feet above mean sea level (AMSL) is relatively small and has few implications for aviation safety. Much of this information is based on data collected from resting subjects and may not reflect the true impact of hypoxia on an aircrew engaged in operational tasks.

A survey listing common symptoms of hypoxia (difficulty with calculations, feeling lightheaded, delayed reaction time and mental confusion) was given to Australian army helicopter aircrews that had operated at altitudes up to 10,000 feet AMSL. One or more symptoms consistent with hypoxia were reported by 86.6 percent of nonpilot aircrew members and 60.9 percent of pilots. Additionally, narratives from 21 aircrews found that potentially operationally significant symptoms were seen at a mean altitude of 8,462 feet.

Many U.S. Army Soldiers are regularly operating in theater at altitudes between 10,000 and 18,000 feet AMSL. There seems to be increasing evidence that brain function and vision are both subtly affected by the moderate levels of hypoxia at these altitudes once thought to be completely safe. In recent years, there have been accidents where both skill and judgment failures are believed to have been associated with hypoxia at moderate altitudes. Due to advances in the understanding of hypoxia and the potential risks presented by operations at altitude, the U.S. Army Aeromedical Research Laboratory (USAARL) recently focused work on countering its effects at lower altitudes (between 10,000 and 18,000 feet).

There are only two ways to solve this hypoxia problem: fly lower or provide oxygen to the crew. Both means have been used, but when the mission absolutely dictates that aircraft are taken high, supplementary oxygen is the only answer. The special operations people have been using a system for years that provides them with a partial fix for getting enough oxygen at altitude. It's a simple system of an oxygen bottle with a manual adjustment and some hospital tubing to the nose, which is not an ideal solution. Product Manager Air Warrior tasked USAARL to come up with a better portable

oxygen system for potential use by U.S. Army helicopter aircrews.

Working with industry, the Army has come up with a system that can provide oxygen in a fully automated manner via an adjustable nasal cannula or mask. The oxygen doesn't flow at all times as in previous hardware configurations. This significantly reduces the risk of fire and makes the oxygen last much longer. A bottle the size of a helicopter emergency egress device provides about two and a half hours of oxygen at 15,000 feet. This new system is called the Personal Helicopter Oxygen Delivery System (PHODS).

The PHODS is not perfect, as some people find the nasal cannula uncomfortable. Also, because the oxygen delivery pulse is triggered by negative pressure, some training is required to get used to the shot of oxygen going up the nose. However, the PHODS has been tested for function in both the altitude chamber and three types of aircraft. So far, it has performed well, delivering enough oxygen that an aircrew using it should not have any problems with hypoxia. In fact, pilots using it were fine up to 18,000 feet.

> "There seems to be **INCREASING EVIDENCE** that **BRAIN FUNCTION** and **VISION** are both subtly **AFFECTED** by the **MODERATE** levels of **HYPOXIA** at these **ALTITUDES ONCE THOUGHT** to be completely **SAFE.**"

The USAARL also tested the PHODS to see if the cannula and mount had any safety effects on the HGU-56P helmet. The additional weight is about 90 grams and has little effect on the helmet's center of gravity or impact protection and does not increase the likelihood of neck strain or injury.

For the guys in the back of aircraft who are more physically active, the mask system has a built-in function which will deliver more oxygen on request. While these bottles will run out in a shorter amount of time, they are easy to change on the fly and, in suitably equipped aircraft, can be plugged into onboard consoles to be refilled. The PHODS appears to be a simple and practical solution to hypoxia in unpressurized aircraft—rotary or fixed wing.«

"apple jELLY"

GREG LAUSIN
The Boeing Company

"How about that fuel sample?" It's a phrase every aviator has asked the crew chief before preflight. I must admit a cursory look at the fuel sample was all that was required, and, sometimes, it was nothing more than asking the crew chief if one had been taken. I rarely gave it more thought than that … until now.

The story began during the week of Oct. 8, 2007, when a non-U.S. AH-64D operator experienced uncommanded engine oscillations on three AH-64Ds while operating in Italy. One AH-64D experienced two separate episodes of uncommanded engine oscillations, and two other AH-64D crews experienced a single episode. In the most serious incident, one of the crews had responded to severe engine oscillations by retarding one power lever to idle when the remaining engine--also oscillating--flamed out. This required the crew to execute an autorotation to an emergency landing. Two aircraft experienced engine oscillations nearly simultaneously and approximately 12 kilometers (km) apart.

The investigation began with our looking at maintenance data recorder (MDR) data from each aircraft. We noted the uncommanded engine oscillations were not consistent with any previously observed behavior pattern of the GE-T-700-701 engine series. The engines exhibited unusual indications of low torque, along with a high gas generator (Ng) and high turbine gas temperature (TGT) readings. The engines were surging well into the engine stall region with large torque splits and divergent high/low oscillating power turbine speed (Np) and rotor speed (Nr) to engine overspeed and underspeed limits. The initial challenge was sorting out whether one or both engines were misbehaving. We thought the data had to be wrong—it contradicted our preconceived notions of how twin-engine helicopter propulsion malfunctions should appear.

Multiple hypotheses were considered to explain the behavior. Since the occurrences happened to multiple aircraft over a fairly large geographic area, could electromagnetic interference (EMI) from a nearby source be the culprit? Was a new, secret directed-energy weapon being used by terrorists? What about the possibility of sabotage? How about fuel contamination? But contaminated fuel would just kill the engines outright, affecting both at the same time, wouldn't it?

As we continued to analyze these events, we knew we had to figure out what conditions, systems or components on the aircraft could cause the engines to behave this way. Experience told us that during EMI testing, high power levels could affect aircraft systems; but on the AH-64D, it usually only affected cockpit displayed indications and not the actual function of systems.

The next thing we knew, we were on our way to beautiful southern Italy to meet with the operator. Interviews with maintenance personnel and review of maintenance actions proved to be productive and revealing. Before deployment, the refuel section was instructed to drain and clean the fuel truck. Complying with instructions, the fuel truck was emptied and cleaned out per the manual. The truck was then sealed and driven to Italy via Switzerland. Upon arrival, the fuel truck was filled with fuel to await the arrival of four Longbows.

Normal procedures required the fuel handlers to take a fuel sample from the truck before dispensing it into any aircraft. After the incidents, fuel samples were drawn from the truck and analyzed. Local Aqua-Glo testing did not reveal anything out of the ordinary. A second sample was sent to Shell Oil Corporation for analysis and, again, the test results were good. The investigation team discovered that a large quantity of water (at least five 5-gallon buckets) was drained off before getting a clean sample, which was the sample tested locally and also sent to Shell for analysis. The team learned that this operator generally did not take daily fuel samples from the aircraft. With this information in hand, the team conducted a closer look at the fuel systems of each aircraft.

A closer inspection of the aircraft was facilitated by hand-turning each engine. A noticeable grinding noise was heard emanating from the fuel control unit (hydromechanical unit (HMU)) on three of the eight engines. The HMUs were removed, and each engine was hand-turned again. This time, the grinding noise was not present. There was no apparent indication of external damage to the HMUs, HMU driveshafts or the mounting plate assemblies on the accessory sections of the engines. Fuel samples were obtained from the fuel cells, the HMUs and the fuel filter bowls. Close examination of the fuel samples revealed a free-floating cellulose substance that looked like the white stringy stuff in egg drop soup. Additionally, a gel-like substance was adhered to the bottom and sides of the fuel filter bowls that required scraping to remove. As the samples were allowed to settle, the gel-like substance began to coagulate into a larger ball of material. The gel-like material was sticky. Samples of the fuel with the cellulous material were sent to Shell for analysis. The HMUs were sent to their original manufacturer for teardown evaluation.

Initial reports from the vendor indicated that the HMU sent for analysis passed the initial production acceptance test but failed when fuel was hooked up. Several valves were stuck, which would have prevented the HMU from operating normally. General Electric, the engine manufacturer, responded that if the contamination caused valves within an engine HMU to stick, the indications we had seen in the MDR data could occur. While nothing could be positively identified as the cause of the engine oscillation events, it appeared likely that fuel contamination was the culprit.

To eliminate the possibility of EMI as a source, a hand-held spectrum analyzer was used to measure all radio frequency energy and broadband field strength that might be in the area. There were no emissions in the area that could produce enough energy to affect TV reception, let alone a helicopter in flight 12 km away.

It was learned later that the gel-like substance was a variation of "apple jelly." No, not the apple jelly you spread on your biscuits in the morning, but a gel-like substance that predominantly affects fixed-wing aircraft fuel systems. This contamination occurs when jet fuel with an anti-ice additive combines with an excessive amount of water. Several instances of this kind of contamination have been documented inside fuel cells, but not in fuel control system components on engines.

The moral of this story is to take fuel samples seriously. This operator was lucky that no one was injured and that no aircraft were lost.

> "The initial **CHALLENGE** was **SORTING** out whether **ONE** or **BOTH ENGINES** were **MISBEHAVING.**"

LOST

AVIATION

AH-64 A Model

CLASS A

While conducting a night vision goggles training mission, the crewmembers could not move the pedals during final approach, which was caused by the tail rotor malfunctioning in a fixed position. Subsequently, the aircraft rapidly descended and went into an incontrollable right yaw. As a result, the aircraft crashed, damaging the tail wheel and landing gear before coming to rest upright. The rated student aviator received minor facial abrasions and the instructor pilot received minor injuries. (Late report)

CLASS B

The crew received a HIGH ROTOR indication on final approach, followed by a No. 2 engine-out audio indication. Inspection revealed transmission and main rotor system damage. The accident investigation board determined it was caused by materiel failure. The No. 2 engine driven alternator (SN-DT411956) failed because of an internal short of the power winding, resulting in a rapid overspeed of the No. 2 engine due to the reduced power setting at the time of the engine driven alternator failure. (Late report)

CLASS B D Model

The maintenance crew was performing aircraft run-up when smoke was observed coming from the target acquisition and designation system/pilot night vision system (TADS/PNVS) area. Inspection revealed burn damage to TADS, turret sensor sight, electronic control unit (ECU), power supply and electronic unit.

The crew experienced a generator failure in flight, followed by smoke in the cockpit. During shutdown, the main rotor blade made contact with the PNVS.

OH-58 D(R) Model

CLASS C

The aircraft contacted the ground during a training autorotation.

HH-60

CLASS C A Model

Post-MEDEVAC mission inspection revealed the left auxiliary power unit (APU) door was missing and damage to two main rotor blades.

UH-60

CLASS C A Model

The crew experienced a steady decrease in the No. 2 engine oil pressure reading during flight. Post-flight inspection revealed the engine oil cap was not secured. Engine scheduled to be returned to depot.

DO YOU USE A CHECKLIST DURING PREFLIGHT TO ENSURE YOU DON'T FORGET ANYTHING, ESPECIALLY WHEN IT COMES TO CHECKING OIL CAPS FOR SECURITY?

CLASS C L Model

The aircraft was undergoing engine run-up as part of a 120-hour inspection. During the vibration check, the crew experienced a loud report. Inspection revealed a cable from the AVA Kit had separated and was ingested by the engine.

DO YOU INSPECT YOUR EQUIPMENT FOR SERVICEABILITY AND CHECK EQUIPMENT PRIOR TO ATTACHING IT TO THE AIRCRAFT?

UAS

MQ-1W

CLASS C

The PM Contractor was operating the UAS for military training purposes when the system experienced a low oil pressure indication.

MQ-5A

CLASS C

The UAS initiated an uncommanded descent to ground impact during launch.

MQ-5B

CLASS C

The UAS experienced an aft engine RPM droop during flight. Post-flight inspection revealed the engine was damaged beyond repair.

RQ-7B

CLASS B

On return flight, the engine RPM decreased, resulting in the UAS not gaining sufficient altitude to land safely. The system touched down outside of the forward operating base (FOB) with damage and was recovered.

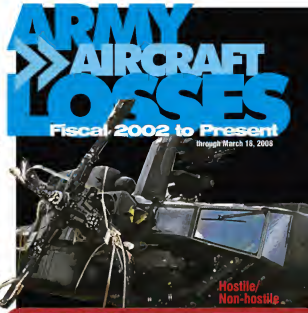
The UAS experienced an engine failure during landing. A controlled landing to a location beyond the FOB was conducted.

Operator crew received indication of system ignition failure following an engine malfunction. The recovery chute was deployed and damaged system was recovered.

The UAS crashed and was rendered destroyed following a series of system indication anomalies and subsequent loss of control.

CLASS C

The UAS experienced a launch failure and subsequently



AH-64A/D	11/51
U/MH-60A/L	8/27
C/MH-47	7/16
OH-58D	11/25
TOTAL	37/119

AMV	9/8
ACV	3/0
PERSONNEL INJURY includes weapons handling accidents	17/15
FIRE/ EXPLOSION	3/3
PROPERTY DAMAGE	1/0
TOTAL	33/26

impacted the ground and rolled into the safety net.

- The UAS crashed on final approach for landing.

GROUND

ACV

CLASS B

- A Stryker was damaged when it overturned during reliability testing. The Stryker's left wheels had run off the course and entered soft dirt. When the driver attempted to steer back onto the course, the vehicle flipped.

- A Bradley Fighting Vehicle was damaged when it rolled off a bridge into a canal. The crew was thrown against the right side of the vehicle, but all escaped without injury.

- A Soldier suffered a permanent partial disability injury when the M1117 Armored Security Vehicle he was riding in was struck by a 5-ton truck.

AMV

CLASS A

- A Soldier was killed when the M923 he was driving rolled over, pinning him underneath. The driver was not wearing his seat belt. The assistant driver, who was also not wearing a seat belt, suffered minor injuries. The U.S. Army Combat Readiness/Safety Center accident review board found the driver failed to stay alert and attentive. The board also found the assistant driver, who was text messaging on his cell phone, failed to maintain continuous situational awareness.

- A Soldier in the gunner's position of a HMMWV was killed when the vehicle overturned. The driver of the HMMWV was also injured in the accident.

CLASS B

- A Soldier suffered a permanent partial disability injury when his M1114 was struck from behind by an M88A2 Hercules and overturned.

Personnel Injury

CLASS A

- A Soldier suffered a permanent total disability injury when he was shot in the back of the neck by a Soldier who was handling his weapon in an inappropriate manner.

- A Soldier suffered fatal injuries when he collided with another Soldier at about 100 feet above ground level during a HALO free-fall exercise and struck the ground. The other Soldier was uninjured.

- A Soldier suffered fatal injuries when he fell off a skateboard and struck his head on the ground.

- A Soldier was killed when the backhoe he was operating on a 45-degree slope overturned. The Soldier was attempting to dig a storm shelter on his property.

- A West Point cadet was fatally injured when he was struck by a train. The cadet had been visiting local establishments when, for unknown reasons, he attempted to cross a set of railroad tracks near the train station.

- A Soldier was found unresponsive in the shower. The cause of death was reported as electrocution.

- A Soldier suffered fatal injuries after falling from the 17th floor balcony of a beach condominium. The fall was deemed an accident.

CLASS B

- A Soldier was attempting to lift his assault pack on his back when his weapon accidentally discharged, striking him in the foot.

- A Soldier suffered a permanent partial disability injury when he stuck his hand in the fan guard of an air conditioner, severing the tip of his pinkie finger.

- Three Soldiers suffered serious burns while conducting a controlled burn with JP-8 to clear a canal line.

POV DRIVING LOSSES

Fiscal 2008

Class A accidents/Soldiers killed

CARS	24/24
SUV/JEEPS	5/6
TRUCKS	5/4
MOTORCYCLES	18/17
OTHER*	2/2

TOTAL DEATHS

FY07 43 ▼ 46

CLICK IT OR TICKET CAMPAIGN

The National Highway Traffic Safety Administration's Click It or Ticket campaign will run May 19 through June 1, 2008. Click It or Ticket is the most successful seat belt enforcement campaign ever, helping to create a seat belt usage rate of 82 percent.

Other

CLASS A

- A Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System and a 107-foot telescoping tower were damaged when an attempt was made to lower the tower without the proper equipment.

DRIVING

POV

CLASS A

- A Soldier was attempting to go around a turn in his privately owned vehicle (POV) when he collided head on with another vehicle. Neither the Soldier nor his two passengers were wearing their seat belts. The Soldier and his backseat passenger died at the scene.

- Two Soldiers were drag racing on a street when one lost control and struck and killed another Soldier next to the road at the race's end point.

- A Soldier was driving his POV with his wife and two other friends when he attempted to pass in a no-passing zone and collided head on with another vehicle. The Soldier and the driver of the other vehicle were pronounced dead at the scene.

- Two high school split-option National Guard Soldiers were riding home together from basic training at their drill station when the driver lost control of her vehicle, which then left the road and struck a tree. Although the 17-year-old driver and her 18-year-old passenger were wearing their seat belts, both died in the accident.

- Two Soldiers were riding together as the driver began weaving in and out of traffic at high speed. The driver struck a curb and the vehicle left the road, struck a telephone pole and a tree, became airborne and ejected the driver. The driver was pronounced dead at the scene, while the passenger was taken to a local medical center with minor injuries. Initial reports indicate that alcohol was involved and neither Soldier was wearing their seat belt.

DO YOUR SOLDIERS UNDERSTAND THAT ALCOHOL AND ASPHALT DON'T GO TOGETHER?

POM

CLASS A

- A Soldier was killed in a single-vehicle motorcycle accident when he attempted negotiate a sharp curve on his sport bike, lost control and crashed. The Soldier was properly licensed, had attended Motorcycle Safety Foundation (MSF) training and was wearing all of his required personal protective equipment (PPE).

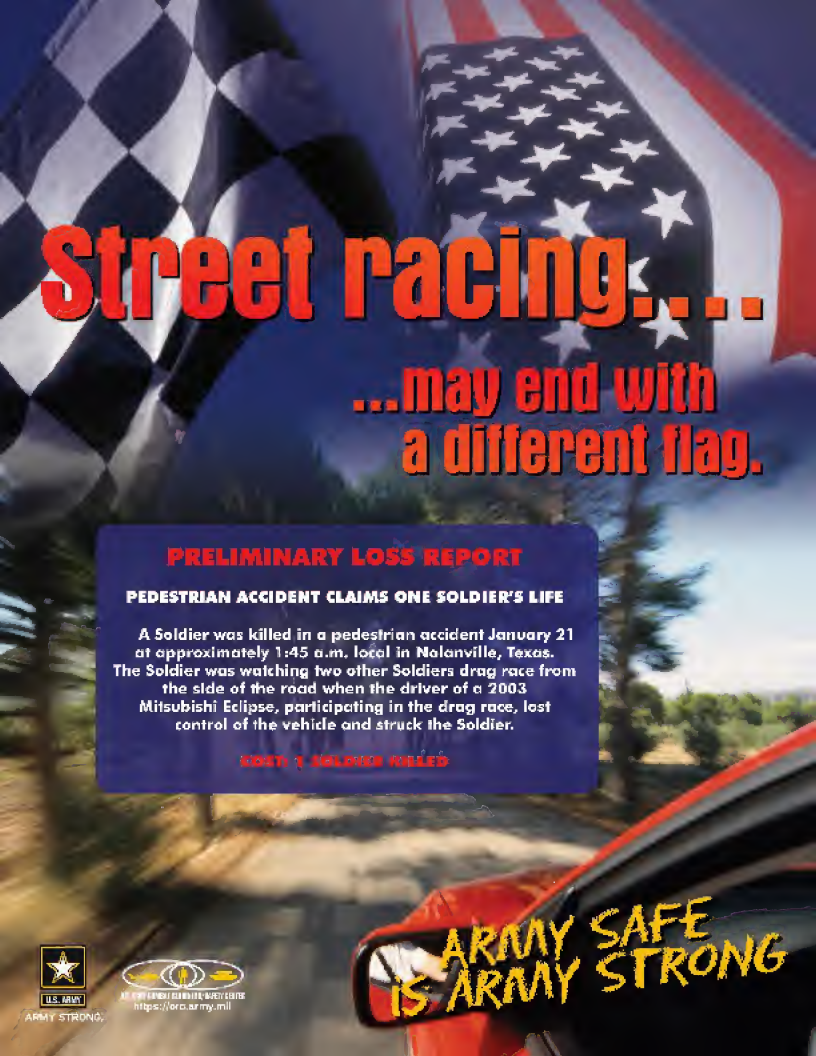
- Two Soldiers were operating their motorcycles at high speed when one reportedly lost control and struck a guardrail. The Soldier suffered fatal injuries and was pronounced dead at the scene. Both Soldiers were licensed, MSF trained and wearing their PPE.

- A Soldier was operating his sport bike just after midnight when he reportedly lost control, left the road and struck a guard rail. The Soldier, who was wearing his PPE, suffered fatal injuries and was pronounced dead at the scene.

- A National Guard Soldier was operating his cruiser as he rode home from his duty station when, for unknown reasons, he collided with the back of another vehicle. The Soldier, who had been wearing his helmet and gloves, was pronounced dead at the scene.

- A Soldier was operating his sport bike at a high rate of speed when he rear-ended a semi-trailer and was killed.

DO YOUR SOLDIERS UNDERSTAND TAKING NEEDLESS RISKS CAN BRING TRAGEDY TO THEIR FAMILIES AND LOVED ONES?


Street racing....
...may end with a different flag.
PRELIMINARY LOSS REPORT
PEDESTRIAN ACCIDENT CLAIMS ONE SOLDIER'S LIFE
A Soldier was killed in a pedestrian accident January 21 at approximately 1:45 a.m. local in Nolanville, Texas. The Soldier was watching two other Soldiers drag race from the side of the road when the driver of a 2003 Mitsubishi Eclipse, participating in the drag race, lost control of the vehicle and struck the Soldier.
COST: 1 SOLDIER KILLED
ARMY SAFE IS ARMY STRONG
U.S. ARMY
ARMY STRONG.
https://orc.army.mil